

Nalco Docket No.: 7726-NES

Customer No. 000049459

**REMARKS**

This is in reply to the Office Action mailed on January 14, 2007 ("Office Action").

Claims 1-32 are currently pending.

Claims 1,2, 4-8, 12-17, 19 and 20 are rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983 ("Treybig").

Claims 1, 3, 9, 10 and 11 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499 ("McCoy").

Claims 26-28 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108 ("Arora").

Claims 21, 22 and 25 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Published Patent Application No. 2003/0008781 ("Gupta").

Claims 29-31 are rejected under 35 U.S.C. 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent 4,417,048 ("Soula").

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent 5,779,405 ("Bruhnke").

Claims 18 and 32 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig").

The nonstatutory obviousness-type double patenting rejection of claims 29-31 over claims 1, 2, 8 and 9 of U.S. Patent No. 6,569,983 is withdrawn.

The rejection of claim 30 under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent No. 4,830,827 ("Au") is withdrawn.

Claims 26-28 are cancelled without prejudice to reduce the matters at issue.

No new matter is added by this amendment.

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**DISCUSSION****The Rejection of Claims 1, 2, 4-8, 12-17, 19, 20, 29 and 31 under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983**

Claims 1, 2, 4-8, 12-17, 19 and 20 are rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,569,983 ("Treybig"). In reply to Applicant's arguments in the Amendment and Reply dated December 4, 2006, the Examiner states:

Applicant amends Claim 1 to further specify the alkylating agent to overcome Treybig, however said alkylating agent is optional. Thus the rejection stands.

Office Action at page 2.

Applicant respectfully traverses this rejection.

As discussed in Applicant's previous Amendment and Reply, Treybig discloses a branched polyhydroxyetheramine which is in all instances prepared by reacting a polyhydroxyetheramine backbone with an N-alkylating agent to prepare the branched polyhydroxyetheramine. The N-alkylating agent is a compound of formula  $R_{11}X$  where  $R_{11}$  is  $C_5-C_{25}$  alkyl or alkenyl where the alkyl or alkenyl is optionally substituted with one or more oxygen atoms. Col. 3, line 65 to col. 4, line 16.

As noted by the Examiner, the instant claims recite a water-soluble alkylene oxide branched polyhydroxyetheramine which is optionally reacted with an acid or alkylating agent of formula  $R_{14}X$  where  $R_{14}$  is  $C_1-C_4$  alkyl and X is halogen, sulfate or sulfonyl to form the salt. See claim 1.

Applicant respectfully points out, however, that regardless of whether the claimed alkylating agent is optional, the end product is in all instances different from the branched polyhydroxyetheramine according to Treybig. More particularly, in instances where the claimed polyhydroxyetheramine backbone is reacted with the claimed N-alkylating agent, the product is different than branched polyhydroxyetheramine according to Treybig because the N-alkylating agents are different. In cases where the claimed polyhydroxyetheramine is not alkylated, the products are different because the branched polyhydroxyetheramine according to Treybig is alkylated in all instances.

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Applicant further respectfully points out that regardless of the nature of the alkylating agent the claimed polyhydroxyetheramine backbone is different from the polyhydroxetheramine backbone according to Treybig.

In particular, Applicant respectfully points out that the claimed polyhydroxyetheramine backbone is prepared by reacting a diepoxide with one or more alkylene oxide functionalized amines and one or more amines having two reactive hydrogen atoms.

The polyhydroxyetheramine backbone according to Treybig is prepared by reacting an amine having two reactive hydrogen atoms with a diepoxide. See Abstract, col. 1, lines 52-58, col. 4, lines 29-33 and Examples. Thus, Applicant respectfully asserts that the polyhydroxyetheramine polymer backbone of Treybig lacks the claimed alkylene oxide functionalized amine component.

Accordingly, as Treybig discloses a different polymer than the polymer of this invention, Applicant respectfully requests withdrawal of the rejection of claims 1, 2, 4-8, 12-17, 19, 20, 29 and 31 under 35 U.S.C. § 102(e) over Treybig.

The Rejection of Claims 1, 3, 9, 10 and 11 under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499

Claims 1, 3, 10 and 11 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 4,396,499 ("McCoy"). In reply to Applicant's arguments in the Amendment and Reply dated December 4, 2006, the Examiner states:

Applicant argues that McCoy does not incorporate an amine having 2 reactive hydrogen atoms. Examiner disagrees. The diamines of McCoy have 4 reactive hydrogen atoms, which inherently reads over the 2 reactive hydrogen atoms as Claimed.

Further, Examiner notes McCoy does disclose monoamines having only 2 reactive functional groups in Example IV. Though not the preferred embodiment, this is taught to be functionally equivalent to diamines (See Table: Demulsifier Testing).

Office Action at page 3.

Applicant respectfully traverses this rejection.

Applicant respectfully asserts that regardless of the previously asserted structural differences between the claimed water-soluble alkylene oxide branched polyhydroxyetheramine and the polymer

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according to McCoy, McCoy discloses a different method of using the polymers, particularly a method breaking oil in water bituminous emulsions. See Abstract, col. 1, lines 6-10 and col. 2, lines 54-65.

In contrast, this invention is a method of modifying the permeability to water of a subterranean formation comprising injecting into the subterranean formation an aqueous composition comprising the claimed water-soluble alkylene oxide branched polyhydroxyetheramine is injected into the subterranean formation.

Accordingly, as McCoy does not disclose injecting a polymer composition into a subterranean formation, Applicant respectfully requests withdrawal of the rejection of claims 1, 3, 10 and 11 under 35 U.S.C. § 102(e) over McCoy.

The Rejection of Claims 26-28 under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108

Claims 26-28 are rejected under 35 U.S.C. § 102(b) over U.S. Patent 5,760,108 ("Arora").

Applicant has cancelled claims 26-28 without prejudice, thereby rendering this rejection moot.

The Rejection of Claims 21, 22 and 25 under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 in view of U.S. Published Patent Application No. 2003/0008781

Claims 21, 22 and 25 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Published Patent Application No. 2003/0008781 ("Gupta"). In reply to Applicant's arguments in the Amendment and Reply dated December 4, 2006, the Examiner states:

... Claim 25 was mistakenly forgotten in the previous action by the Examiner, however, it is rejected over the 2-3% range as included in Examiner's previous statement of rejection.

Applicant argues that Gupta does not make up for the deficiencies of Treybig, Examiner disagrees, see above. Applicant further argues the use of the polyhydroxyetheramine in a known process or in combination with known ingredients of Gupta is nonobvious. Examiner disagrees. Addition of the stabilization salts will increase or maintain the permeability of the clay in the subterranean formation.

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Applicant respectfully traverses this rejection.

As discussed above, Applicant respectfully asserts that Treybig discloses a different polymer than the claimed polyhydroxyetheramine. Applicant further respectfully asserts that Gupta discloses an unrelated surfactant composition and that nothing in Treybig or Gupta teaches or suggests the equivalence to the claimed polyhydroxyetheramines, which are not surfactants, and the surfactants according to Gupta.

Applicant again respectfully asserts that it is settled law that when a process involves a novel material, patentability of the process is linked to the material. See *In re Pleudemann* 910 F2d 823, 15 USPQ2d 1738 (CAFC 1990), *In re Durden, Jr. et al.*, 763 F2d 1406, 226 USPQ 359 (CAFC 1985), *In re Mancy*, 499 F2d 1289, 182 USPQ 303 (CCPA 1974) and *In re Kuehl*, 475 F2d 658, 177 USPQ 250 (CCPA 1973). Thus, while it may be true that addition of stabilization salts according to Gupta will increase or maintain the permeability of clay in a subterranean formation as asserted by the Examiner, Applicant respectfully asserts that this is irrelevant to the patentability of a process involving the claimed novel polyhydroxyetheramine in combination with the salts.

Accordingly, as the water-soluble, branched polyhydroxyetheramine of this invention is novel and nonobvious over the polymer of Treybig and nothing in Gupta or Treybig teaches or suggests the equivalence of the disclosed surfactants and the claimed water-soluble, branched polyhydroxyetheramines, Applicant respectfully requests withdrawal of the rejection of claims 21, 22 and 25 under 35 U.S.C. § 103(a) over Treybig in view of Gupta.

The Rejection of Claims 29-31 under 35 U.S.C. 103(a) over U.S. Patent 6,569,983 in view of U.S.

Patent 4,417,048

Claims 29-31 are rejected under 35 U.S.C. 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent 4,417,048 ("Soula"). In particular, the Examiner states:

Treybig includes elements of the invention as discussed in the action dated 8/2/06. Treybig discloses the use of alkylating agents such as chlorooctane (Column 4 Line 6). Treybig does not include the use of methyl chloride or dimethyl sulfate, as required by the above Claims.

Soula discloses the N-alkylation of organonitrogen compounds. Agents for said alkylation include chlorooctane and methyl chloride. It would have been obvious

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to one of ordinary skill in the art at the time of the invention to include in Treybig, the use of methyl chloride, as taught by Soula, since this is recognized in the art as being functionally equivalent to chlorooctane.

Office Action at page 4.

Applicant respectfully traverses this rejection.

As discussed above, Applicant respectfully asserts that Treybig discloses the alkylation of different polymers using different alkylating agents.

Applicant respectfully asserts that Soula discloses the alkylation of amines having a reactive amino hydrogen with alkylating agents in the presence of base and a sequestering agent. See Abstract.

In contrast, Applicant respectfully asserts that claims 29-31 recite formation of a water-soluble, alkylene oxide branched polyhydroxyetheramine salt by reaction of the polyhydroxyetheramine with certain alkylating agents or acids. Applicant respectfully asserts that Soula does not disclose the formation of salts and further that salts cannot form in the presence of base and sequestering agents as disclosed by Soula.

Therefore, Applicant respectfully asserts that any teaching in Soula regarding the purported equivalence of alkylating agents such as methyl chloride and chlorooctane is irrelevant to the patentability of claims 29-31 as Soula does not concern salt formation and the conditions described therein will not result in the formation of salts. Applicant further respectfully asserts that even if the claimed alkylating agents are substituted for the alkylating agents according to Treybig the end product will be different given that the starting materials are different. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 29-31 under 35 U.S.C. 103(a) over Treybig in view of Soula.

The Rejection of Claims 23 and 24 under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig")  
in view of U.S. Patent 5,779,405 ("Bruhnke")

Claims 23 and 24 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 ("Treybig") in view of U.S. Patent 5,779,405 ("Bruhnke"). In reply to Applicant's arguments in the Amendment and Reply dated December 4, 2006, the Examiner states:

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Applicant argues that Bruhnke does not make up for the deficiencies of Treybig, Examiner disagrees, see above. Applicant further argues (1) the polyhydroxyetheramine of Bruhnke is not comparable to applicants and (2) there is no incentive to choose ethylene glycol monobutyl ether from the laundry list of solvents. Examiner disagrees. The polyhydroxyetheramine of Treybig and Bruhnke are similar if not identical materials. Examiner requests experimental results to the contrary. Further it is the Examiner's position that one would immediately envisage the use of said solvents from the small list of Bruhnke. If Applicants persist in said argument, Examiner requests experimental data showing unexpected results stemming from the addition of 0.005 to 2% of these well known solvents.

Office Action at page 5.

Applicant respectfully traverses this rejection.

As discussed in Applicant's previous Amendment and Reply, Applicant respectfully asserts that Bruhnke discloses a fundamentally different polymer than Treybig. More particularly, Applicant respectfully asserts that the colorants according to Bruhnke are not polymers and do not contain polyhydroxy groups but rather are monomeric amines resulting from reaction of Jeffamines and an alkylating compound. See col. 10, lines 17-64 and Examples. As opposed to the polymers disclosed by Treybig, the molecular weight of the colorants according to Bruhnke, which do not posses any repeating units derived from diepoxy components, are only as large as the sum of the molecular weights of the Jeffamine and the alkylating compound.

Given that the solubility characteristics of macromolecules and monomeric products can vary significantly, Applicant respectfully asserts that one of skill in the art would not be motivated to look to the teaching of Bruhnke for inspiration in formulating the unrelated polymer of Treybig.

Finally, as discussed above, even if the teachings of Treybig and Bruhnke are combined and proper selection is made from the solvents and concentrations disclosed by Bruhnke, Applicant respectfully asserts that the end result would be different from the claimed invention as Treybig discloses a different polymer. In light of the foregoing, Applicant is at a loss as to how he can show any unexpected result, as the claimed invention does not fall within the teachings of Treybig or Bruhnke, alone or in combination. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 23 and 24 under 35 U.S.C. § 103(a) over Treybig in view of Bruhnke.

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The Rejection of Claims 18 and 32 under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983

Claims 18 and 32 are rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,569,983 (“Treybig”). In reply to Applicant’s arguments in the Amendment and Reply dated December 4, 2006, the Examiner states:

The rejection is as set forth in the previous action dated 8/2/06. Applicant argues that Treybig does not teach the alkylating agents of instant application. Said agent is optional as discussed above. Applicant offers no argument as to the obviousness rejection previously set forth.

Office Action at page 5.

Applicant respectfully traverses this rejection.

As discussed in detail above, Applicant respectfully asserts that Treybig discloses both a different alkylating agent and a different base polymer.

More particularly, Applicant respectfully asserts that nothing in Treybig teaches or suggests the equivalence of the claimed water-soluble alkylene oxide branched polyhydroxyetheramine which contains alkylene oxide functionalized amines in the polymer backbone and the polyhydroxyetheramine according to Treybig which does not.

Applicant further respectfully asserts that nothing in Treybig teaches or suggests the equivalence of salts prepared by reacting the claimed water-soluble alkylene oxide branched polyhydroxyetheramine with an acid or alkylating agent of formula  $R_{14}X$  where  $R_{14}$  is C<sub>1</sub>-C<sub>4</sub> alkyl and X is halogen, sulfate or sulfonyl and the branched polyhydroxyetheramine according to Treybig which is formed by alkylation of the polyhydroxyetheramine backbone disclosed therein with an alkylating agent of formula  $R_{11}X$  where  $R_{11}$  is C<sub>5</sub>-C<sub>25</sub> alkyl or alkenyl where the alkyl or alkenyl is optionally substituted with one or more oxygen atoms.

Accordingly, as Treybig does not teach or suggest the claimed water-soluble alkylene oxide branched polyhydroxyetheramine or its salt, Applicant respectfully requests withdrawal of the rejection of claims 18 and 32 under 35 U.S.C. § 103(a) over Treybig.

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**CONCLUSION**

In view of the foregoing amendment and remarks, Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. §§§ 102(e), 102(b) and 103(a) and respectfully asserts that this application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully Submitted,



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